IFHTSE Medal

The IFHTSE Medal is awarded from time to time for internationally recognised distinguished achievements in Heat Treatment and Surface Engineering. These may equally be seminal scientific findings or innovative breakthroughs in our industry which are widely published and cited.

The medals are generously provided by SC Plasmaterm SA, Romania.

Bell, Tom	University of Birmingham, UK
Wyss, Urs	MAAG Gear Co., Switzerland, and first IFHTSE Secretary
Krauss, George	Colorado School of Mines, Golden, CO, USA
Maki, Tadashi	Kyoto University, Japan
Mittemeijer, Eric	Max Planck Institute for Metals Research, Stuttgart, Germany
Totten, George	Texas A&M University, USA, and Totten Associates
Bhadeshia, Harshad Kumar Dharamshi Hansraj "Harry"	University of Cambridge, UK
Somers, Marcel	Technical University of Denmark, Lyngby
Speer, John	Colorado School of Mines in Golden, CO, USA

Citations

Tom Bell, University of Birmingham, UK

Medal presented at the 14th Congress, Shanghai, October 2004

This first award of the Medal recognised a wide and multidisciplinary range of globally visible contributions, over more than 30 years, to heat treatment and surface engineering.

Bell influenced progress from the viewpoints of materials science, materials engineering, design engineering, tribology, economics, and environmentally benign process development.

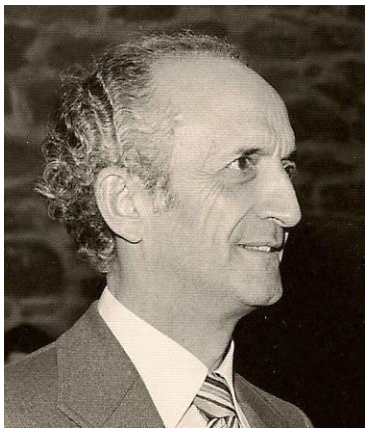
He was one of the originators of the concept and term 'surface engineering' and remains one of its foremost promoters. In academic life his effective teaching has produced graduates now contributing to progress in this field in many countries.

In addition to his contributions to IFHTSE over many years, particularly as a member of its Executive Committee, Bell was twice President – for 1983-1984 and for 2000-2001. He was

appointed Fellow of IFHTSE in 2003.

Urs Wyss, formerly MAAG Gear Co. Switzerland, and first IFHTSE Secretary

Medal presented at the 15th Congress, Vienna, September 2006



Primarily, the award recognised the enormous contribution made by Wyss to international communication and collaboration through his seminal work as the Secretary of IFHTSE from its foundation in 1971-72 until 1988. In that period, and especially in the early days, his dedication, charm and easy ability in German, French and English ensured a successful launch for the Federation. He wrote the constitution, inspired the early meetings, encouraged his collaborators and fostered fruitful East-West relations. Without him, it is unlikely that the venture would have been so fruitful.

Wyss combined his organisational and administrative skills with a successful materials engineering career in industry. Originally graduating in chemistry before he was 20, he began work in 1939 at Von Roll-Stahlwerke, Gerlafingen, where he concentrated on steel hardenability and hardenability testing. In 1952 he moved to Maag Zahnräder AG, Zürich. As manager of the metallurgical laboratory and heat treatment workshop, he led the development of the "Eintropfverfahren" technology (a drip-feed method using liquid hydrocarbons). Known commercially as the Carbomaag Process it brought him many international patents. Significant publications resulted from his industrial work and he was a frequent contributor to AWT's Wiesbaden Härterei-Kolloquium and other conferences.

In 1982, AWT of Germany awarded him the Adolf Martens medal. He was President of the Swiss Society for Heat Treatment in 1953, when he was only 30, and was appointed Honorary President in 1972. He is also an Honorary Member of the Association Technique de Traitement Thermique (ATTT), France. He is Honorary President of IFHTSE.

George Krauss, Colorado School of Mines, Golden CO, USA

Medal presented at the 16th Congress in Brisbane, Australia, October 2007

George Krauss' contributions to education and research in the metallurgical and materials engineering community are extensive and significant at all levels. Foremost, he is a teacher's teacher, committed to educating new metallurgical engineers and the continuing updating of practising engineers. In addition to the numerous students he has influenced over the years, his teaching accomplishments are most obvious in his classic textbook 'Steels – processing, structure, and performance'. This text, along with his numerous other publications, has formed the basis of many courses. His educational efforts have been recognised in many teaching awards, including the Albert Easton White Award from ASM in 1999.

His vision for the steel industry led to the development of the Advanced Steel Processing and Products Research Center in 1984, an industry/university cooperative that continues today as the most successful programme of its kind in the world. Research in the centre emphasises heat treating and surface processing of steels.

His research on steels is extensive. Of particular note is his work on the relationship between microstructure and properties of low-temperature tempered high-carbon steels. This research refined the understanding of the fracture behaviour of martensitic steels, critical to the understanding of the fracture behaviour of carburised steels. The research also led to new alloying and process methods that have been adopted globally. His achievements have been recognised in several awards, including the Adolf Martens Medal for 1990 and the Edward DeMille Campbell Memorial Lecture Award from ASM in 2000. He is a Fellow of ASM, a Distinguished Member of the Iron and Steel Society of AIME, and an Honorary Member of the Iron and Steel Institute of Japan. He has contributed significantly to professional associations in the metals and heat treating industries, most notably as President 1989-90 of the International Federation for Heat Treatment and Surface Engineering, of which he is a Fellow, and as President of ASM International.

Tadashi Maki, Kyoto University, Japan

Medal presented at the 17th Congress in Kobe, Japan October 2008

Professor Maki's significant contribution to the development of materials science in the context of heat treatment and surface engineering is represented by his research on the principles of microstructure evolution by phase transformation, precipitation, deformation and recrystallization in ferrous and titanium alloys from a number of viewpoints especially thermodynamics, kinetics, crystallography.

Of particular note is his work on the microstructure and properties of martensite and bainite in steels through systematic examination of the morphology and internal structure of martensite in alloy steels. He successfully clarified the principle behind thin-plate martensite morphology which led to development of a ferrous alloy with superior shape memory effect. Further, his study on bainite transformation has contributed significantly in the understanding of its transformation mechanism.

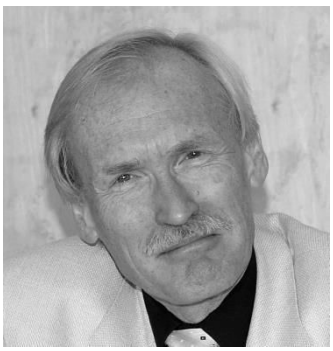
Equally important is his work on grain refinement of steels and titanium alloys through thermomechanical processing. He obtained submicron sized ferrite grains in high carbon steels with high strength and good ductility. He has also investigated hot/warm deformation structures and achieved high strain rate superplasticity in duplex stainless steels by dynamic continuous recrystallization producing high-angle boundaries capable of grain boundary sliding.

His achievements have been recognized in many awards, including the Nishiyama Award from the Iron and Steel Institute of Japan (ISIJ), the Honda Memorial Lecture Award from the Japan Institute for Metals (JIM) both in 2007, the Hayashi Memorial Prize from the Japan Society for Heat Treatment and best paper awards from ISIJ, JIM and the UK Insti-

tute of Materials Minerals and Mining. He has contributed significantly to professional associations in the metals and heat treating industries, most notably as Vice President of the Japan Society for Heat Treatment (2001-2003), and President of the Iron and Steel Institute of Japan (2002-2004).

Eric Jan Mittemeijer, Max Planck Institute for Metals Research, Stuttgart, and Institute for Materials Science, University of Stuttgart

Medal presented at the Conference 'Reducing energy consumption in heat and thermal treatment technologies and installations', Brașov Poiana, Romania, November 2010



The award recognises Professor Mittemeijer's contributions to global knowledge transfer in heat treatment, especially in nitriding and nitrocarburising, as well as in the field of phase transformations in both ferrous and non-ferrous alloys.

Eric Mittemeijer graduated from Delft Technical University in 1972 after studying chemical technology and specialising in physical chemistry. He gained his PhD after study at the Foundation for Fundamental Research of Matter in 1978. Thereafter he returned to Delft as the deputy leader of the group Heat Treatment Science of Ferrous and Non-Ferrous Alloys. In 1985, at the age of 35, he was appointed to the departmental chair of Physical Chemistry of the Solid State. After a short period as Vice-Dean of the Faculty of Chemical Technology and Materials Science, he moved to Stuttgart in 1998 to his present position as Director at the Max Planck Institute for Metals Research in Stuttgart and Full Professor (chair holder) at the Institute for Materials Science at the University of Stuttgart.

His specialist 'chemical viewpoint' has yielded broadly based contributions to the field of heat treatment of immense significance for the advancement of the understanding and control of the processes. Since his move in 1998 to Stuttgart, he has founded and led the Phase Transformations department at the Max Plank Institute for Metals Research. He has built up a multidisciplinary team of 40-45 people of diverse nationalities, using an extensive range of equipment for X-ray diffraction analysis, scanning Auger microscopy, X-ray photo-electron spectroscopy, ellipsometry; calorimetry and dilatometry. Appropriately, his expertise has ensured that the department's contributions have been in the field of phase transformations in solid materials. Using a cutting-edge experimental approach, important contributions have been made to the development of models for phase transformations. These models apply not only to bulk but also to nano-scale materials, and are intended to be of practical value in optimising material properties by controlling the material microstructure, as well as providing insight into the fundamentals. He has, of course, published widely and has more than 550 papers to his name. He also serves on the editorial boards of many journals and has been centrally involved in the planning of many conferences and the publication of their proceedings. He was editor of 'Diffraction Analysis of the Microstructure of Materials' (Springer, 2004) and, significantly, co-editor of the 'European White Book on Fundamental Research in Materials Science' (2001) which played a major role in the formulation of the EU 6th Framework Programme. In 2010 he was appointed Managing Editor of *International Journal of Materials Research*.

He contributes to the work and activities of national and international societies: he was

co-founder and President of the Dutch/Belgian Heat Treatment Society, co-founder and President of the (Dutch) Society of Metals, member of the Board of the Heat Treating Society of ASM International, member of the International Center for Diffraction Data (ICDD), chairman of the AWT working group on Nitriding and Nitrocarburizing. From 1998 to 2004 he was Chairman of the European Powder Diffraction Committee (EPDIC). He was a key member of the organising committees for the 10th and 11th IFHTSE Congresses (Brighton UK 1996, and Florence, Italy 1998, respectively).

He has received many honours for this work, including: Fellowship of ASM International, ASM European Lecturer 1991-92, Jacob Wallenberg Award of the Royal Academy of Engineering Sciences of Sweden (1993), Honorary President of the Dutch-Belgian Society of Heat Treatment (1996), Honorary Member of the Netherlands Society of Metals (1998) and Honorary Professor, Tianjin University (2006).

His work is widely recognised by industry, and he has been a member of the Supervisory Board of, and an advisor to SKF Engineering & Research Centre BV, and SKF Engineering & Research Services BV. Among his areas of activity are: phase transformations, thermodynamics and kinetics, development and relaxation of stress and phase transformations in thin (multi)layers, and nitriding and nitrocarburizing of ferrous materials. Further, he is Speaker of the International Max Planck Research School on Advanced Materials (IMPRS-AM; at the moment about 35 Ph.D. students, 75% are of foreign origin), and 'Studiendekan' (responsible for the teaching and the development of a new Bachelor/Master programme on Materials Science) and chairman of the Board of Examinations for the Study of Materials Science (Werkstoffwissenschaft) at the University of Stuttgart.

Mittemeijer was born in 1950 in Haarlem, Netherlands.

George Edward Totten, Texas A&M University, College Station TX, USA,
and G.E. Totten Associates, LLC - SEATTLE WA, USA

Medal presented at the 19th Congress, Glasgow, Scotland October 2011

George Totten's scientific and technical credentials are self-evident from the literature and from the extensive contributions he has made, and continues to make, in the field of heat treatment and surface engineering, especially in the critical and difficult area of quenching. George's sound 'chemistry viewpoint' has been particularly noteworthy and valuable. When George was made a Fellow of IFHTSE at the 15th Congress in Vienna, Austria in 2005, the citation encapsulated the nature of his contribution to progress: 'In recognition of his extensive contribution, over many years, to the global spread of knowledge of heat treatment process development especially in the field of quenching, to the understanding of process chemistry, and recently to the better and more widespread use of modelling and simulation.'

A vital characteristic is his ability to look outwards, not only to see 'who is doing what?' but also to identify *what* is needed. In all his actions he demonstrates great energy and enthusiasm, constant willingness to listen to the ideas and needs of others, and an easy-going and productive sociability. He is not, however, a man to accept anything at face value

or because it may be 'traditional' - he is always ready to challenge for the sake of doing things better or of responding to differing circumstances. He is known for basing his views on integrity rather than received wisdom or doctrine. George, a prominent and popular figure on the international conference scene is always good natured and friendly and has built a reputation for being approachable. He is always making new friends and cementing ties with old ones. More than that, he is admired by many for his ready help, support and guidance in their professional development. As President of IFHTSE for the two-year period 2002-2003, he was provocative and challenging, but as a result, always a positive and productive leader. He has had a very strong influence on ensuring that good contributions to progress and knowledge transfer globally are identified and integrated – especially notable have been his contacts and interactions with organisations and individuals in China, Japan and Latin America. He has been an essential and key performer in the two series of international conference 'Quenching and distortion control' originally launched by ASM in 1992, and 'Modelling and simulation in heat treatment and surface engineering' which began in China in 2000.

George received his BS and MS degrees from Fairleigh Dickinson University in New Jersey and his PhD from New York University. In addition, George is a Fellow of ASM International, SAE International, IFHTSE, ASTM International, and he is a Founding Fellow of AMME (World Academy of Materials Manufacturing Engineering). Since his retirement from 32 years with Union Carbide Corporation) George has been a Visiting Research Professor at Portland State University, Portland OR and he is currently an Adjunct Professor in the Department of Mechanical Engineering at Texas A&M University in College Station TX and a Visiting Professor at the University of São Paulo in São Carlos SP, Brazil. He is also president of G.E. Totten & Associates LLC, Seattle WA, a research and consulting firm specializing in Thermal Processing and Industrial Lubrication problems.

George has received various awards throughout his career, some of which include: ACS Outstanding Chemistry Student Award - 1970; Union Carbide Corporate Fellow Outstanding Technologist Award - 1994; ASTM Excellence in Symposium and Publication Management - 1997; Honorary Member of the Russian Metallurgists Association - 1998; ASTM Committee D-2 Award of Excellence - 2000; SAE McFarland Award - 2000; ASTM Committee D-2 Scroll of Achievement Award - 2004; ASTM Award of Merit - 2006; Honorary Member of the Shanghai Heat Treatment of Metals Society - 2006; Founding Fellow AMME (World Academy of Materials Manufacturing Engineering) - 2006; Bodeen Award - Heat Treating Society of ASM International - 2007; ASTM Dudley Award - 2008

In addition to these various activities, Dr. Totten is the author or co-author (editor) of approximately 600 publications including patents, technical papers, chapters and books. In addition to the now-classic *Handbook of Quenchants and Quenching Technology* (ASM International, 1992) which he co-authored with Prof. Charles Bates and Dr. Nye Clinton. George recently co-edited two recent books on quenching: *Quenching Theory and Technology* 2 edn (CRC Press, 2010) with Prof. Bozidar Liščić, Prof. Hans M. Tensi, Prof. Lauralice C.F. Canale and *Intensive Quenching Systems: Engineering and Design* (ASTM International, 2010) with Dr. Nikolai Kobasko, Dr. Michael Aronov and Joseph Powell.

George was born in Toledo OH in 1945.

Harshad Kumar Dharamshi Hansraj "Harry" Bhadeshia, University of Cambridge, UK

Medal presented at the 23rd Congress, Savannah GA, USA, April 2016

Born in Kenya, and of Indian descent, Harry Bhadeshia moved to the UK in the 1970s. He graduated in 1976 at the City of London Polytechnic and obtained his doctorate at the University of Cambridge in 1979 for work on the theory and significance of retained austenite in steels. He worked as a UK Science Research Council Research Fellow until 1981 when he moved back to the University of Cambridge. He has remained there since, but he has worked also with British Steel (now Tata Steel Europe) on a carbide-free, silicon-rich bainitic steel for rails in the Channel Tunnel and with the British Ministry of Defence on high-performance armour steel. He has received several awards of the UK IOM3 including the Bessemer Gold Medal. In 2008, he became the first Tata Steel Professor of Metallurgy and in 2009 he established, and took the lead at, the new SKF University Technology Centre, to conduct research on the physical metallurgy of bearing steels. He is a Fellow of the Royal Society and of the Academy of Engineering of the UK.

Marcel Somers, Technical University of Denmark, Lyngby

Medal presented at the 26th Congress, Moscow, Russia, September 2019

The award recognizes Prof. Somers' contribution to the understanding and application of metal-gas reactions in metals engineering processes generally identified as thermochemical surface engineering.

Marcel Somers (born in 1960, in Vlissingen, The Netherlands) graduated and obtained his Ph.D. degree (in 1989) at the Delft University of Technology in the Netherlands. Already at this time his work was devoted to the nitriding and nitrocarburizing of iron-based materials.

In 89/90 he was with Philips Center for Materials, Technology and Innovation as section leader in advanced materials characterization. He returned to Delft University of Technology as assistant professor in physical chemistry of the solid state in 1990 and was appointed full professor of physical metallurgy at the Technical University of Denmark in 1997. There he built up his own group and successfully developed his independent research programme. Perhaps best known is his work on expanded austenite. He was one of the first to reveal the true nature of this unstable solid solution, which was before confusingly called "S-phase". He became a world leading scientist in this area and dominates the corresponding literature until today.

A red thread through Somers' scientific work is gas-metal interactions in surface engineering and gaseous corrosion along with microstructure characterization with light and electron microscopy, X-ray diffraction, particularly residual stress determination, spectroscopy and thermal analysis. Furthermore, his interests encompass martensitic transformations at cryogenic temperatures and thermodynamics and diffusion modelling. His work is of fundamen-

tal character with a technological importance and spin-off for industrial application.

Marcel Somers is an enthusiastic educator in physical metallurgy, materials characterization and surface engineering and has co-authored about 300 contributions in international journals, conference proceedings and chapters in books. He is co-editor of the comprehensive book "Thermochemical Surface Engineering of Steels". Moreover, he is co-inventor of 12 patents, all of which have been implemented in industrial applications, and co-founder of the industrial spin-outs Expanite and TRD Surfaces.

Somers has a keen interest in practical applications of his scientific work. This is not only illustrated by his twelve patents, but also by his activity as co-founder, together with collaborators from his group, of two industrial spin-outs "Expanite" and "TRD Surfaces".

He was awarded the Brandsma prize (1989); ASM European Lecturer (1999); Reinholdt W. Jorck prize (2001); DTU's innovation prize (2007); Alex Foss gold medal for rewarding contributions to engineering sciences (2014) and is Fellow of ASM International (2016). He is an elected member of the Danish Society for Technical Sciences (ATV) since 1999 and was chairman of the Danish Research Council for Technology and Production Sciences (FTP) from 2007 to 2009.

John G. Speer, Colorado School of Mines in Golden, CO, USA

Medal yet to be presented

"For his life-time achievement in physical metallurgy, development and heat treatment of advanced steel concepts from theory to practical application, with particular focus on his leading role in the development of the Quenching and Partitioning Process"

John G. Speer combines excellent academic work with a close relationship to industrial partners and practical application of his findings. The core of his industrial and academic research activities are advanced heat treatment processes based on a deep understanding of physical metallurgy in combination with advanced alloy concepts. This approach which comprises both process and material is recognized worldwide as a milestone in the development of new steels and their applications. He was among the initiators and is the leading driving force for the development of the Quenching and Partitioning Process, which is certainly one of the major advancements for heat treatment in recent years.

John G. Speer is the John Henry Moore Distinguished Professor of Physical Metallurgy at Colorado School of Mines, and Director of the Advanced Steel Processing and Products Research Center (ASPPRC). He received a B.S. degree from Lehigh University in Metallurgy and Materials Engineering, in 1980 and a D.Phil. in Physical Metallurgy from the University of Oxford, UK in 1983. He served in various positions at the Homer Research Laboratories of Bethlehem Steel Corporation from 1983-1997, where he was involved in prod-

uct research, customer and operations support, and research management. He became a Professor in the Department of Metallurgical and Materials Engineering at Colorado School of Mines in 1997, and has also served as Mines' Associate Vice-President for Research from 2008 until he became Director of ASPPRC in 2013.

He has received a number of awards such as the AIST Tadeusz Sendzimir Medal and Hunt-Kelly Award, American Iron and Steel Institute Gold Medal, Institute of Materials Charles Hatchett Award, AWS William Spraragen Memorial Award, SAE/AISI Sydney H. Melbourne Award, Villares Prize of ABM (Brazil), Dean's Excellence Award for Teaching and Research-Colorado School of Mines, and the Henry Bessemer Gold Medal from IOM3 in London. John is also a Distinguished Member of AIST and a Fellow of ASM International.

With the medal for Prof. J. G. Speer we follow the tradition to honour excellent work in the field of physical metallurgy for heat treatment like we did with the earlier IFHTSE medals for Prof. G. Krauss (2007), Prof. T. Maki (2008), and Prof. H. K. Bhadeshia (2015).